



U.S. Department of Energy
Energy Efficiency and Renewable Energy

The DOE GATEWAY Demonstration Program

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Session 1: Solid State Lighting Demonstrations

Voices for Efficiency 2008 Workshop

Portland, OR

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Purpose of GATEWAY Program

- Demonstrate new SSL products that will meet three criteria:
 - Save energy
 - Match or improve the existing illumination
 - Offer real economic value to users
- Widely promote successful products
- What the purpose isn't: to identify the “best” lighting investment for a given user/application among all possible alternatives



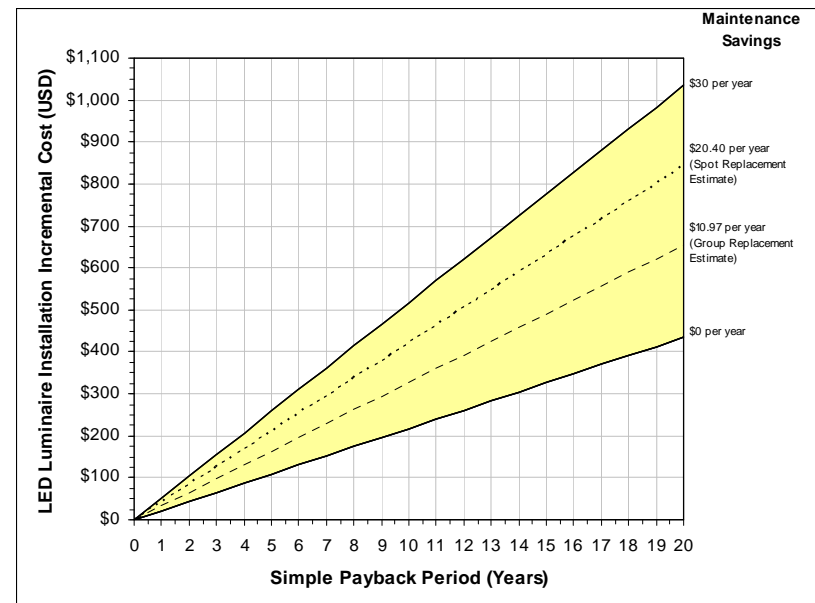
The GATEWAY Demonstration Process

- Several steps:
 - Identification
 - Testing
 - Matching
 - Installation
 - Measurement
 - Feedback
 - Evaluation
 - Documentation and Reporting
- Every project is different in some respect
- Many potential projects don't make it



Oakland, CA Street Light Demo

- 15 Luminaires
- PG&E Emerging Tech, City of Oakland, DOE, Beta LED
- Strong preference expressed for new lighting by residents
- Payback affected by low maintenance of incumbent





William J. Hughes Tech Center, Atlantic City

	Existing 70W HPS	New 3-bar Luminaire	Optional 2-bar Luminaire
Average illumination levels	3.54 fc	3.63 fc	2.42 fc
Minimum illuminance	1.25 fc	1.90 fc	1.27 fc
Max/Min ratio	6.04:1	2.68:1	2.68:1
Total power draw	97W	72W	48W
Energy savings per luminaire	N/A	114 kWh/yr (26.8%)	215 kWh/yr (50.6%)
Simple payback if HPS are at end of life, includes maintenance savings	N/A	7 yr	3 yr

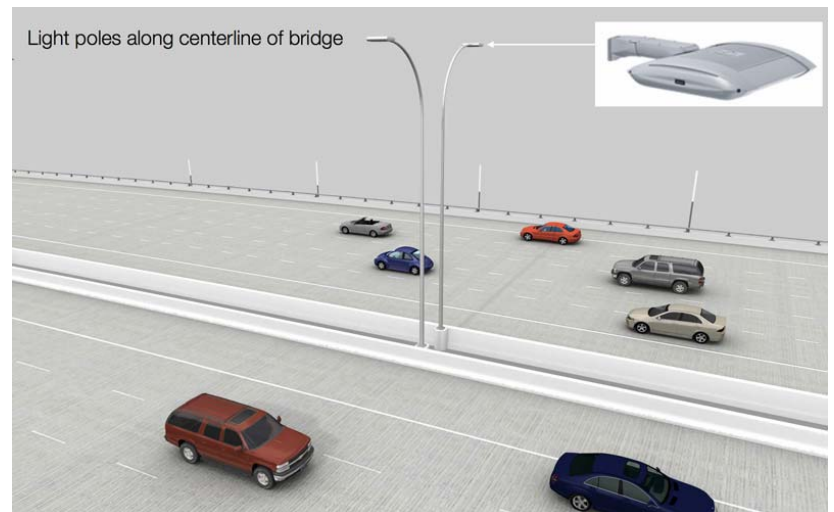
Simple payback
of 3-7 years
possible

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St. Anthony Falls Bridge, Minneapolis

- 20 luminaires across bridge
- MnDOT, FHWA, DOE, Beta LED
- 12% energy savings projected
- Longitudinal aspect of study is unique
- “The major leagues”





JWC

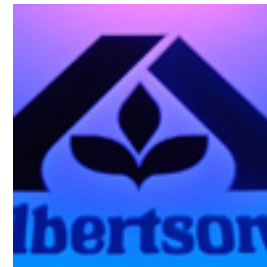
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Freezer Case and Garage Lighting

Freezer Case:

- T-8 replacement with LEDs
- 30% to 50% energy savings projected
- Potential area for in-depth report by DOE



Garage Lighting:

- HPS replacement with LEDs
- 55% energy savings projected
- Potential for additional controls for more savings





NW "Green" Builders

- Downlight replacements, undercabinet luminaires
- Builders, DOE, Energy Trust of Oregon, Cree/LLF, Philips
- Over 80% energy savings (vs. incandescent) projected
- Fully dimmable
- Homes to be featured on 2008 Eugene Tour of Homes



Incandescent



LR6





Retailer Energy Alliance: LED Parking Lot Lighting Working Group

- Working Group comprised of 10 REA Members, including Wal-Mart, Home Depot, JC Penney, McDonald's
- Lighting specification under development
- Gateway Demonstrations with multiple luminaires / brands / locations will inform specification
- Goal is to lead to large scale procurement



before

after

Photos: GE Lumination



Technology Demonstrations Are Critical

- Significant interest in SSL technology
- Most are still relatively unfamiliar with it
- Opportunities for impact, both positive and negative, are great



New Paradigms Are Needed

- Luminaire efficacy is different than source efficacy!
- Efficacy is only part of the energy efficiency picture
 - How effectively are the lumens used?
- Economic analysis needs to consider life cycle cost issues, e.g., maintenance, rather than first cost only



Primary Challenges

- LED technology has reached the level of performance where it can both save energy and improve lighting quality, but
 - Proper product design critical
 - As is proper application of the product



Ill-suited product app (non-DOE demo)

“I just don't like them.”

-- Resident quoted in the Minneapolis/St.
Paul Star Tribune



Primary Challenges

- First cost continues as the main hurdle



GATEWAY Demonstrations

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Website

- www.netl.doe.gov/ssl/techdemos.htm